



## LETTERS

## USE OF TESTS IN UK PRIMARY CARE

# Clinical implications of increased testing in primary care

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O'Sullivan and colleagues showed a marked increase in test usage in primary care.<sup>1</sup> This has implications not only for general practitioner workload, but also for clinicians interpreting test results. Despite rising testing rates we are not seeing a concomitant rise in disease incidence. Presumably testing is shifting into populations at lower risk of disease.

But tests work in a bayesian fashion, meaning that interpretation depends on two things—the performance characteristics of the test itself and the subgroup of people it is performed on (the prior odds or pretest probability of disease).

This can have counter intuitive implications; we have shown, for example, that people with normal test results have an increased risk of cancer.<sup>2,3</sup> This is because merely conducting a test predicts cancer, and this additional risk is only partly eliminated by a negative test result.

O'Sullivan and colleagues' work, however, suggests dilution of this effect. As we increase testing rates in lower risk populations, the opposite problem may occur—people with positive test results will have a lower incidence of disease. This will lead to

a reduction in the signal-to-noise ratio, lower positive predictive values, and more false positives.

In other words, the more tests we do, the less we can trust the results.

We need better evidence, not only on the diagnostic accuracy of tests but on whom to test in the first place and, perhaps just as importantly, whom not to test.

Competing interests: None declared.

- 1 O'Sullivan JW, Stevens S, Hobbs FDR, et al. Temporal trends in use of tests in UK primary care, 2000-15: retrospective analysis of 250 million tests. *BMJ* 2018;363:k4666. 10.1136/bmj.k4666 30487169
- 2 Bailey SE, Ukoumunne OC, Shephard EA, Hamilton W. Clinical relevance of thrombocytosis in primary care: a prospective cohort study of cancer incidence using English electronic medical records and cancer registry data. *Br J Gen Pract* 2017;67:e405-13. 10.3399/bjgp17X691109 28533199
- 3 Watson J, Bailey S, Hamilton F, Hamilton W, Mounce L. Lessons from biases in electronic health record data: the importance of clinical vigilance with negative test results. *BMJ rapid response*. <https://www.bmj.com/content/361/bmj.k1479/rr-0>

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